

CLAIMS:

1. A clathrate compound represented by the following composition formula (1):

Composition formula (1)  $\text{Ba}_8\text{Au}_a\text{Ge}_{46-a}$

$$(16/3 \leq a \leq 6).$$

2. A clathrate compound represented by the following composition formula (2):

Composition formula (2)  $\text{Ba}_8\text{Au}_b\text{Ga}_c\text{Ge}_{46-b-c}$

$$(5 \leq b < 16/3, c = 16-3b).$$

3. A clathrate compound represented by the following composition formula (3):

Composition formula (3)  $\text{Ba}_8\text{Au}_d\text{Ga}_e\text{Ge}_{46-d-e}$

$$(0 \leq d < 5, e = 16-3d).$$

4. A clathrate compound represented by the following composition formula (4):

Composition formula (4)  $\text{Ba}_8\text{Au}_f\text{Ga}_{6-f}\text{Ge}_{40}$  ( $0 < f < 6$ ).

5. A clathrate compound represented by the following composition formula (5):

Composition formula (5)  $\text{Ba}_8\text{Pt}_g\text{Ge}_{46-g}$  ( $4 < g < 6$ ).

6. A clathrate compound represented by the following composition formula (6):

Composition formula (6)  $\text{Ba}_8\text{Pd}_h\text{Ge}_{46-h}$  ( $5 < h < 6$ ).

7. A clathrate compound represented by the following composition formula (7):

Composition formula (7)  $\text{Ba}_8\text{Pd}_i\text{Ga}_j\text{Ge}_{46-i-j}$   
( $0 \leq i \leq 4, j = 16-4i$ ).

8. A clathrate compound represented by the following composition formula (8):

Composition formula (8)  $\text{Ba}_8\text{A}_k\text{Ga}_l\text{Si}_{46-k-l}$   
( $0 \leq k \leq 4, l = 16-4k$ )

wherein A in Composition formula (8) represents Pd or Pt.

9. A clathrate compound represented by the following composition formula (9):

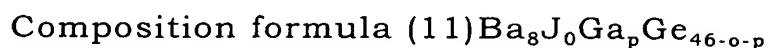
Composition formula (9)  $\text{Ba}_8\text{E}_m\text{Ga}_{6-m}\text{Ge}_{40}$   
( $5 < m < 6$ )

wherein E in Composition formula (9) represents Cu or Ag.

10. A clathrate compound represented by the following composition formula (10):

Composition formula (10)  $\text{Ba}_8\text{G}_n\text{Ga}_{6-n}\text{Ge}_{40}$  ( $0 < n \leq 5$ )  
wherein G in Composition formula (10) represents Cu or Ag.

11. A clathrate compound represented by the following composition formula (11):



$$(0 < o < 16/3, p = 16-3o)$$

wherein J in Composition formula (11) represents Cu or Ag.

12. A thermoelectric conversion element comprising a sintered body of the clathrate compound of claim 1.

13. A thermoelectric conversion element comprising a sintered body of the clathrate compound of claim 2.

14. A thermoelectric conversion element comprising a sintered body of the clathrate compound of claim 3.

15. A thermoelectric conversion element comprising a sintered body of the clathrate compound of claim 4.

16. A thermoelectric conversion element comprising a sintered body of the clathrate compound of claim 5.

17. A thermoelectric conversion element comprising a sintered body of the clathrate compound of claim 6.

18. A thermoelectric conversion element comprising a sintered body of the clathrate compound of claim 7.

19. A thermoelectric conversion element comprising a sintered body of the clathrate compound of claim 8.

20. A thermoelectric conversion element comprising a sintered body of the clathrate compound of claim 9.

21. A thermoelectric conversion element comprising a sintered body of the clathrate compound of claim 10.

22. A thermoelectric conversion element comprising a sintered body of the clathrate compound of claim 11.

23. A method for producing a thermoelectric conversion element comprising a sintered body of a clathrate compound whose constituent atoms include Ba and Ge, the method comprising:

melting elements which are to constitute the clathrate compound so as to synthesize the clathrate compound;

heat-treating the synthesized clathrate compound at 650 to 900 °C for 50 to 250 hours;

forming particles from the heat-treated clathrate compound;  
and

sintering the particles.